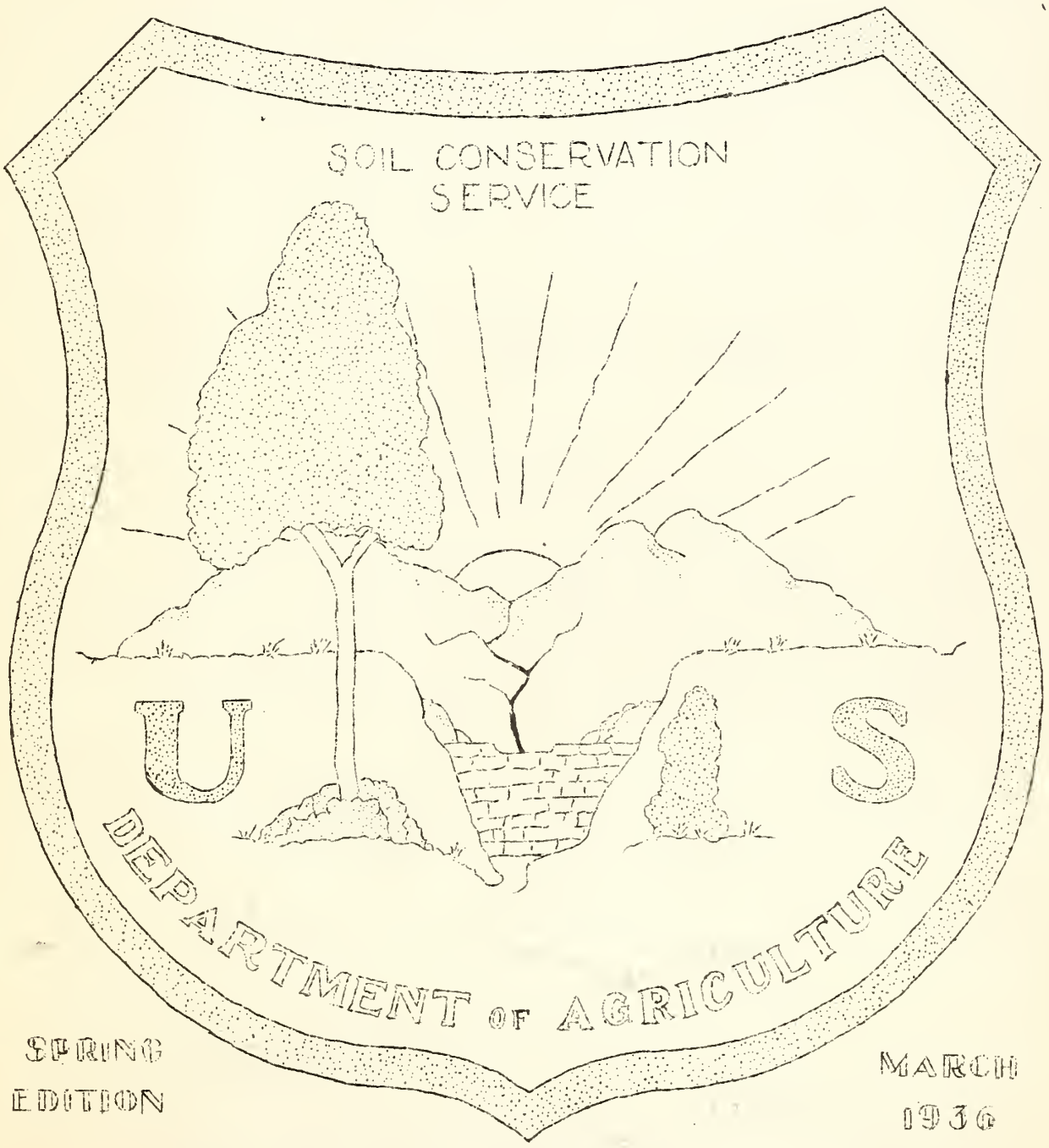
HIGH PLAINS CONSERVATIONIST



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HIGH PLAINS CONSERVATIONIST

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ATTITUDE

H.H.FINNELL, REGIONAL CONSERVATOR

Attitudes are generally produced by various degrees of understanding or misunderstanding about a thing. A most common attitude toward dust storms is one subject to violent reverses. When there is "Dirt in your eye" it may range all the way from a distressed nervous excitement to a nauseating disgust. When Mary is complaining about "tracking in mud" the "Best Citizen" may become highly insulted by the mere mention of a duster.

Since stabilizing soils permanently must depend upon the exercise of intelligent forethought on the part of all the people managing soils it follows that a first step toward conserving plains agricultural resources must be the stabilizing of human attitude toward the problem.

The facts are simple. Understanding will not require mental drudgery.

Witness:

Grass in nature multiplied and protected the rich store of fertility in plains soils

Loss of this fibrous and durable protection through cultivation, or overgrazing exposed the soil to blowing.

Continued blowing assorts the soil particles so as to rapidly increase erosion susceptibility and destroy soil uniformity.

The longer wind erosion is permitted to continue the greater is the damage to soils and the difficulty of recovery.

The remedies in man's hands are natural substitutes for nature's precaution in nature's kind, namely: use of erosion resistant crops and their fibrous residue to protect the soil.

Obviously both economic production and protective soil covering must be obtained during favorable seasons and held over for precaution against unfavorable seasons.

Many unfavorable seasons can be made favorable by better rainfall utilization.

Production opportunities can further be greatly increased by the flexible combination of different types of crops, rather than relying solely upon a single crop.

Planning the farm business on a period basis rather than a yearly basis, in such matters as maintaining feed reserves and operating capital, grazing, and maintaining ability to employ emergency measures when necessary.

Thousands of cautious farmers proved by their experience on all kinds of agricultural and grazing soils that proper land use and conservative precautions have prevented wind erosion during the worst drouth of record.

Alibies are unmistakably "nerts".

Therefore, when good crops are general, prosperity pleasant and spirits high, it is not the time to forget the wind erosion problem but to thank fortune for an even break and plan intelligently to make use of the opportunity for safe and easy precaution against future hazards.

Cultivation reduced the resistance of soil to wind action but it can be partly rebuilt and maintained at a satisfactory level if crop remains are returned to the soil at every opportunity. The longer soils are permitted to blow the more difficult this will be.

There will never be a time in the history of the plains when recovery and complete stabilization can be accomplished with as little effort as at present. The quantity and availability of soil riches in this area are worthy of a studious and persistent effort on the part of all its inhabitants to regain and maintain control over wind erosion. Belittleing or minimizing the importance of this effort is a treachery to a valuable work of nature and a deserving people.

NINE COUNTIES HAVE ORGANIZED WIND EROSION CONSERVATION DISTRICTS

C.W. HUMBLE-ASSOC. INFORMATION SPECIALIST.

The creation and incorporation of Wind Erosion Conservation Districts coextensive with the area of any county in this state, was authorized by House Bill No. 978, as enacted by the Texas Legislature. Nine counties in the Panhandle have organized such districts; including Dallam, Hartley, Oldham, Deaf Smith, Sherman, Moore, Lipscomb, Hansford, and Ochiltree. Other counties are preparing to form Conservation Districts.

PURPOSE OF ORGANIZATION

The purpose of the district is to conserve the soil by prevention of unnecessary erosion caused by winds and the reclamation of lands that have been depreciated or denuded of soil by reason of winds.

Under the soil conservation law, the County Judge and the Commissioners in any county, will have charge of administering the affairs of the district.

HOW DISTRICTS ARE FORMED

A petition signed by fifty qualified tax-paying voters, and presented to the Commissioners Court, can cause an election to be held. A majority vote by qualified tax-paying voters is needed to create a County Wind Erosion Conservation District. These Districts become political sub-divisions when incorporated.

PRIVILEGES AND AUTHORITY

When these Soil Conservation Districts are formed the Governing body has wide and varied powers so that emergency action may be taken to stop ravages of the wind and dust.

They are empowered; To take such action as will prevent or aid in lessening the damage to lands, public roads and highways due to unnecessary movement of soil and dust.

To construct and maintain improvements, to arrest, or prevent wind erosion.

To borrow money and pledge certificates or securities, or income.

To accept grants or gifts, and borrow money from the United States or from any corporation or agency created to make loans or grants.

To sue or be sued in corporate capacity, and to adopt a corporate seal.

To adopt by-laws and rules and regulations incident or necessary to the dispatch of business or discharge of corporate functions.

The Governing body may use 20 percent of the Automobile fees, and part or all of the spedial Road and Bridge fund, in carrying out the work of the district.

To have the right to enter upon and treat any land in the district that is causing damage to other land, cost of such treatment to be assessed against the property, said assessmont to constitute a valid first lien and to be payable, at the option of the owner, in three equal installments, payable in three years, bearing interest at the rate of 5 percent per annum. Assessments cannot be made against homesteads.

A farmer may have his life-savings wiped out if the owner of some adjoining tract of land does not take proper precautions to control wind erosion. Where a farmer does not have funds with which to do the necessary work to prevent erosion, the Governing body may help him to do this work and assess the cost of same against his property.

Due to the extreme wind erosion conditions which existed in the nine counties, mentioned in the first paragraph, the Conservation law provided for the refunding of the State ad valorem taxes, to the Districts, for the years 1935 and 1936, for erosion control work. Through cooperative working agreements between the Extension Service, the Soil Conservation Service, and the local Districts (in above mentioned nine counties), Assistant County Agents are available to the Counties to do Soil Conservation Work.

WHEAT FAILURE OFFERS OPPORTUNITY FOR EARLY TERRACING

E.C. BUIE-ASSOCIATE ENGINEER

A serious problem arises with the failure of a wheat crop. The land is left with no cover whatever and is almost certain to blow unless some measures are taken to prevent it. The surest and most practical method is to get some type of cover crop on the land. However, there is usually a month or six weeks between the time that the failure of the wheat is a certainty and time to plant either an emergency cover crop of a catch crop. This period of time offers an excellent opportunity for terracing.

The value of the terrace lies in retaining rainfall on the land which would otherwise run off. A twenty-one year record of the rainfall at Goodwell, Oklahoma shows that a total average rainfall of 13.52 inches occurs between April 1st and September 30th, or during that time from which the wheat failure becomes a certainty and the next crop is seeded. Of this total rainfall 3.61 inches or 26.7 % occurs in light rains which are ineffective to crop growth or the increase of soil moisture. Of the remaining 9.91 inches of the average rainfall during these months 1.96 inches, or 20 % is lost by run-off on Richfield Silt Loam soil with .7% slope. This leaves only 7.95 inches out of the total 13.52 inches, which is effective and this is even yet subject to evaporation losses. The average run-off

during these months is not only 20% of the effective rainfall during this period but also 60% of the average yearly run-off. Since man's efforts to create rainfall have not been very successful and cultivation practices offer his only practical control over evaporation, his only method of increasing the effective rainfall is to conserve the run-off, which during the period in question is the equivalent of an extra 2 inches of effective rainfall. It is for this purpose that terraces are constructed.

The type of terrace recommended for wheat land is the low broad-base, closed end level terrace. This terrace should be at least thirty feet wide at the base and should have a settled height of from eight to ten inches. Such a terrace offers but little if any difficulty to the handling of large units of farm machinery. These terraces should be spaced vertically so as to get the best moisture distribution which the slope will allow. On the flatter slopes, up to .5% or 6 inches per 100 feet, a 4 inch vertical spacing is very desirable as this will cause water to be backed from one terrace to the other by a 2 inch to 2½ inch rainfall coming in approximately 24 hours. This vertical spacing will allow a horizontal distance between terraces of from about 65 feet to 150 feet. For steeper slopes the vertical spacing should be such as to allow the best moisture distribution possible and yet keep the terraces far enough apart horizontally for practical tillage operations. In all cases it is recommended that the tillage operations be parallel to the terraces in order to obtain proper distribution of moisture.

After terraces have been constructed blank listing on the contour between the terraces will provide the best possible moisture conditions at sowing time for the rainfall received. This condition is also favorable for wide row plantings in the early summer.

WIDE ROW PLANTING AFTER WHEAT FAILURE

R. R. HINDE, ASSOCIATE AGRONOMIST

The past two years of drouth and wheat failures in the High Plains region, has demonstrated that wide row planting of grain sorghums, or strip farming has effectively decreased wind erosion on wheat fields that failed to produce a vegetative cover.

Wide row planting was demonstrated on the Dalhart Soil Conservation Project located in Dallam County, Texas by farmers, during the season of 1935. When their wheat failed to produce a satisfactory cover and the land was in a bare condition a dual purpose, grain sorghum crop was planted in a strip crop pattern.

The farmers instead of fallowing their land in preparation for the next wheat crop, planted milo, hegari and sudan in rows 10 to 15 feet apart. The intervening spaces that were not planted were cultivated during the summer months which is a partial fallow, and at the same time affords a

stubble protection against soil blowing until the wheat has an opportunity of covering the ground. Harvest was done by combines thus leaving a high grain sorghum stubble.

It is highly desirable that a stand of sorghums be obtained, and every effort should be made to secure one. The grain produced from these plantings affords a source of supplemental feed at the time of year when it is highly welcomed by the farmer.

There is no set method or width of strips that can be followed in wide row planting of sorghums after wheat failure. The farmer usually uses the machinery he has available on the farm. This may consist of a single, double, three or four bottom lister, or it may be a deep furrow drill. Any implement that throws up a ridge is desirable.

The ridges should be on contour and may be planted in single rows or double rows and then skip 3 rows or 4 rows, leaving a blank space of approximately 10 to 15 feet between the rows. The ridges being on the contour, across the slope, act as miniature terraces, thus catching and holding the water where it falls, to be absorbed by the soil. The strips of sorghums being on the contour will more effectively prevent soil blowing than where they are run on straight row planting.

INCREASE ROW CROP PRODUCTION BY CONTOURING

E. C. BUIE- ASSOCIATE ENGINEER

The 1935 season furnished some outstanding reasons for contour tillage of row crops. There were very few fields which were farmed parallel to the fence that did not show a decided difference in production in favor of the low side or low points of the field. This was due to the accumulation of the drainage from the rest of the field on these places. This increased moisture supply enabled these small areas to produce an average or bumper crop while the remaining or high parts of the field averaged almost a failure in production. In most instances much of the run-off water got into road ditches, lakes, streams or draws and was lost entirely as far as crop production was concerned.

Mr. Curtis O.Roach, Perryton, Texas, divided his row crop into three lands. These he planted as nearly on the contour as he could by eye, which of course was at best only a rough guess, but far better than disregarding the contour altogether. This land would not average over 1 or 1½ feet fall per 100 feet. In August he received a 1 3/4 inch rain which produced quite a bit of run-off, and while most of his furrows on an approximate contour stood partly full of water, the land next to the fence was pretty well covered due to fence-row drifts acting as a levee and holding the run-off water on this part of the field rather than allowing it to get away in the road ditch. At harvest time, even though the rows had been run as nearly on the contour as he could guess, Mr. Roach stated that the land fartherest up the slope produced no grain at all.

The middle land produced an estimated average of 7½ bushels of grain per acre while the land next to the fence which got the benefit of all the run-off from the 1 3/4 inch August rain produced an estimated average of 15 bushels of grain per acre. In a recent interview Mr. Roach said, "I think contour farming is the only thing to do, and just as fast as I can get it done I am going to farm not only my row crop but also my wheat on a strict contour and reinforce my contour farming with terraces." Mr. Roach is only one of many farmers who have realized during this last year the value of contour farming row crops.

The value of contour farming lies in the conservation and distribution of the rainfall. Each open lister furrow on the level produces a potential reservoir for the rainfall. These furrows by holding the rainfall prevent run-off and hold the moisture where it falls thus giving the most equalized distribution it is possible to achieve with mechanical methods. It is this equalized distribution which produces the greatest average yields per acre and also sufficient cover to protect the land from blowing. The fact that from 70 to 75 percent of the average annual rainfall and the highest rainfall intensities occur during the period from May 1st to October 31st, during which period the lister furrows are either open or partially open, adds to the value of contour furrowing for moisture conservation.

Planting on the contour not only insures a more equal distribution of available soil moisture but also reduces the chances of having to plant over. When a rainfall of high intensity follows closely behind planting not on the contour the furrows acting as ditches carry the water down the slope at such a velocity as to wash up the seed on the slope and cover them too deep at the lower end of the row. This of course makes it necessary to plant over which is expensive and shortens the growing season of the crop.

Point rows, which are a necessary part of contour tillage, constitute the biggest objection to this type of farming. It has been found that tilling the land on the contour does cost a few cents more per acre per year, but the operator must bear in mind that this small additional cost is returned several times over in the increased production and in the more even height and uniform maturity at harvest time, due to the conservation of the rainfall and its equalized distribution over the fields. This with the increased possibility of vegetative cover to protect the land from blowing, makes contour tillage of row crop a desirable practice.

STRIP CROPPING OF CORN, COTTON, AND BEANS
(APPLICABLE TO HIGH PLAINS REGION)

R. R. HINDE-ASSOCIATE AGRONOMIST

There is very little experimental data to show what the width and frequency of strips should be on any given slope, or in any field subject to run-off of water and to wind erosion. If such information

were available, it would only partially solve the problem, unless farmers so happened to be growing the recommended crops and in the correct proportions.

Strip cropping consists of alternating contour strips of close growing soil holding crops with strips of cultivated crops. These strip crops with their dense foliage and root growth will largely control the loss of water and soil.

Planting of strips is economical and simple and they do not require any additional farm expense. Densely growing feed crops, such as sudan, cane, sorghums, and the small grains, as oats, barley and wheat make ideal crops for these strips.

Crop strips are variable in width, and should follow the contour of the slope. The width of erosion resistant strips, in relation to the width of the non-erosion resistant strip crop, is determined by the soil type, the erodibility of the soil, steepness of the slope and the amount and intensity of the rainfall.

For the High plains region at least 1/2 of the total field area should be planted to an erosion resistant crop. On gentle slopes of 2 percent or less, the control strips should be 20 to 60 feet wide. Non-erosion resisting crops such as corn should be planted in strips of 12 to 16 rows alternating with strips of sorghums of equal or greater number of rows. When cotton is grown on lighter textured soils, it is recommended that it be planted in strips of not over 30 rows in width, alternating with strips of erosion resistant crops not less than 10 rows in width. On heavier textured soils, the strips of cotton may be as great as 40 rows in width. Narrower strips of cotton are preferred where ever they can be adopted to the farm program.

According to Mr. L.B.Shenkel of Dalhart, Texas, strip cropping is successful. Mr. Shenkel, who has lived in Hartley County for 37 years and on one farm continuously for 16 years, claims he originated strip cropping in the high plains region. His method of strip cropping consists of listing ten to fifteen rows of corn or grain sorghum in narrow strips across the slope and planting sudan or a hay crop between the strips of row crops.

This method of farming a light textured soil, Mr. Shenkel says prevents runoff and soil blowing, and that increased yields are obtained even in years when the rainfall is below normal.

It is advisable on some of the steeper slopes and on light textured soils where terraces have been constructed, to strip the terraces. The strips should cover one terrace and extend to a distance midway to the adjacent lower terraces. Terraces are easier to maintain in this manner and the soil blowing hazard is reduced materially, rather than where the entire field is planted in a row crop each year.

Strips of corn, cotton, or beans may be planted as wide as desired, half the rows being above the terrace line and half below. This system avoids the short or point rows and removes an objection that farmers

have to terrace and contour farming. If a drilled grain or feed crop is seeded between the cultivated strips, slight irregularities in the shape of the area are not objectionable.

Strip cropping without terraces is adapted to the lighter textured soils where runoff is not great. Strips of dense growing crops are alternated with the clean cultivated crops on the contour.

The surveyed lines are maintained by back furrowing and all farming operations follow these lines. The drilled strips are variable in width in order to eliminate point rows in the clean cultivated crops. Each year the surveyed line is back furrowed which will eventually result in a terraced ridge running through the field on the contour.

On steeper slopes, and on a sandy soil subject to wind erosion, a good plan of procedure would be to seed native grasses in strips adjusted to the contour and supported by parallel bands of sorghums or sudan grass. Between the strips staple crops such as cotton, corn and beans can be produced.

These are crops to be seeded on listed land rather than on flat plowed land, preserving the stubble and exercising the prevention of over grazing on the wheat and sorghum stubble land.

The advantages of strip cropping are as follows:-

1. It can be put into practice by a farmer without any great initial cost.

2. It can be practiced on any degree of slope that can be cultivated.

3. Prevents soil blowing.

4. Encourages a better type of farming.

5. Provides for a variety of crops in the same field without inconvenience.

6. Strip cropping can be used with, and is an excellent supplement to terracing.

The disadvantages of strip cropping are:-

1. Difficulty of rearranging the fields and fences on a farm.

2. Where livestock farming is practiced, some grazing may be lost unless the strips are fenced.

3. In communities where insects are prevelent, damage may result to adjacent growing crops.

4. On irregular slopes it may be impossible to plant cultivated crops in straight rows.

5. Strip cropping will not entirely control erosion.

The procedure to establish a strip farming system will vary with each farm and with the farming system now in operation. The problem is to get the strips laid out as soon as possible in areas where soil blowing is chronic.

A practice of strip farming that is popular in some areas where facilities are not available for terracing, consists in running terrace lines, plowing along these lines, and where the terraces would be otherwise constructed, planting strips of densely growing feed crops such as sudan grass or grain sorghums which will check the loss of soil and water.

Cotton, corn, and beans are planted on the contour parallel to the strips. Thus each row serves as a minature terrace to conserve the water and causing more of it to sink into the soil. As soon as the crops on the control strips are harvested, the land is available for terrace construction. In this manner the control strips will prevent wind erosion during the early spring and summer months, and it will thus be possible to terrace during the late summer and fall months when there is ample time for terracing.

Regardless of what means of erosion control practices may be attempted in the High Plains region, short protected slope lengths must be provided if low losses on erosible cultivated crop lands are expected.

SEEDING ERODED & CULTIVATED LAND TO NATIVE GRASSES ON DALHART PROJECT

F. S. REYNOLDS, ASSOCIATE AGRONOMIST

There is a wide spread interest among farmers and ranchers in the high plains region in retiring cultivated land to native grass pastures. For several years many cultivated fields, due to drouth and wind erosion, have yielded little or no economic returns in this area, furthermore numerous fields have lost from 2 to 12 inches of top soil by wind erosion. Thousands of other cultivated fields have severely hummocked and are badly blown.

The loss of income from these lands together with the damage of wind erosion, have caused many land owners to consider getting part of their lands covered with grass. Grass lands properly managed are safe from wind erosion damage and yield profitable returns from grazing.

It is common observation that cultivated land will eventually regain its cover of native grasses if not farmed for a period of years. This process requires from five to fifteen years and perhaps longer in some

cases, depending on how long the field has been broken, the proximity of grass land to furnish a seed supply, grazing received, and rainfall. It has been observed by farmers and ranchers that fields which have been broken from the native sod and farmed for two or three years only, will regain their grass stands in a shorter time than fields farmed for a longer period.

In addition to the damaged lands needing to be retired to grass to protect them from further wind damage, there are many fields adjacent to pasturos, whose owners desire to put them in native grass to increase their pasture acreage. There are several instances of this on the Dalhart project. There are also many fields with poor soils yielding unprofitable crops which would yield greater returns as grazing lands.

The Soil Conservation Service is assisting cooperators who desire to get cultivated fields in grass by demonstrating practical methods of harvesting grass seed in quantity, securing vegetative cover for protection of grass plantings as well as demonstrating practical methods of reseeding.

To this end, last year four plots on as many soil types ranging from sandy to tight lands were planted to grama grass. Fairly good stands were secured on three of these plots which received from 10½ to 14½ inches of rainfall during the growing season from April to September inclusive, as shown by rain gauges near by.

The fourth plot, which failed to produce a stand of grama grass, had only 7 inches of rainfall during the growing season, while the average rainfall of these months for the last 30 years is 14.01 inches, as shown by the U.S.Dry Land Experiment Station, Dalhart, Texas. Even this plot with only one-half the average rainfall produced scattered grama grass plants.

The plots were 10 by 90 feet on land prepared by listing, which were without any kind of crop residues or vegetative cover, [illegible]. No nurse crop was planted, except one which was in a field already planted to sudan. Volunteer vegetation competed with the grass on all plots for moisture during the growing season.

Eight or ten pounds of seed per acre was sown broadcast by hand May 16, 24 and 29, a favorable time as general showers occurred before and after plantings. No effort was made to cover the seed.

The plot planted in a sudan field produced a better stand than any of the others. However, it is believed the superior stand was due primarily to a more favorable moisture supply and not to the sudan, which was grazed to the ground later in the summer. The rainfall here during the growing season was 14½ inches, while the highest received by any other plot was for the same period 11½ inches. It is probable that the stand was reduced to some extent by the trampling of the cattle grazing the sudan, but it is doubtful if any of the grama plants were large enough to furnish any grazing.

The plot receiving 11½ inches of rain during the growing season produced a fair to good stand of grass. Adjacent to this plot, 3½ acres of contour listed land, which was terraced, was also sown to blue grama resulting in a spotted stand. This area was also bare of crop residues at the time of planting and no nurse crop was sown to protect the seedlings. In addition to larger plants to be seen at a glance, numerous small ones, some of which apparently came up with late rains, can be found by closely examining the ground. Plants are more numerous in the furrows, terrace channels and small depressions receiving excess water supply. Many plants in the terrace channels produced seed. It is believed that farmers and ranchers in general, would be satisfied with this stand as a beginning in getting a field to grass. It is plainly evident that a favorable moisture supply is highly desirable in securing a satisfactory stand of this grass. Therefore water conservation measures in the form of terraces and contour ridges need to be given serious consideration in this connection.

More elaborate tests are underway to learn additional facts relative to securing stands of blue grama grass on lands to be retired from cultivation.

The information at hand indicates that it might be worthwhile to sow grama seed in the winter or spring on land that has a sufficient cover to protect the young seedlings from blowing soil.

Three fields to be returned to grass consisting of 930 acres, on the Dalhart project, were planted to sudan with a lister in contour rows in the spring of 1935, to secure a vegetative cover for protection of the grass to be planted in 1936. Two of these fields in sandy soils receiving 14½ inches of rainfall during the growing season produced sudan from 4 to 5 feet high. In October a severe hail destroyed the sudan seed and badly battered the forage. However, it is believed there is sufficient cover to warrant the planting of the grama grass seed. Therefore one field was sown broadcast when covered with snow in January at the rate of 3½ pounds of grama and 5½ pounds of sweet clover seed. The other field is to be sown in a similar manner, except that the seed will be sown at any convenient time during the winter and not necessarily on snow.

It is believed there will be enough seed covered by wind, rains, and snows to insure a fair stand if the season is favorable. If the seed were drilled or covered with a harrow on these fields, consisting of sandy soil that shifts easily, the possible damage to the cover would far outweigh the doubtful advantage of getting the seed into the ground with implements.

The sweet clover is being planted with the grass seed to perpetuate the cover after the sudan grass residue is gone, to furnish grazing before the grass is fully established and to improve the soil.

Grazing will be postponed as long as is necessary to obtain a good grass cover.

GERMINATION OF BLUE GRAMA GRASS SEED ON DALHART PROJECT

DICK PERRIN-AGRICULTURAL AIDE (AGRONOMY)

A composite sample of blue grama grass seed was taken from seed which was harvested last fall near Romero, Texas. By germination test and counts the following facts were obtained.

Upon counting several thousand florets or mash, it was found that 38.4% of the florets contained caryopses or kernels. This may be considered a high per cent. It was also learned that 1000 florets weighed 7 grains, which is a million florets per pounds, and with these figures it was found that one pound of blue grama grass seed contained 384,167 caryopses or kernels. Therefore, in planting three pounds of seed per acre, there could be expected 27 kernels per square foot if perfectly distributed.

A germination test was made of the above mentioned seed in Sandy Loam Soil under ideal conditions, and ninety-six per cent of the kernels germinated. Therefore by planting three pounds of blue grama grass seed under absolutely ideal conditions and perfect distribution, it might be possible to obtain twenty-six seedlings per square foot. These results are only indicative, because they have been carried on from only one year seed supply and from one locality.

CONTOUR FURROWING NATIVE PASTURES

W. E. CONNELL - ASSISTANT RANGE EXAMINER

The greatest single problem on the high plains at the present time is the menace of wind erosion. The only sure and permanent solution to that problem is the establishment and maintenance of a complete vegetative cover of which native grass sod is the most effective. Therefore, the restoration and maintenance of our native pastures is of prime importance.

One of the most important things to consider in accomplishing this end is the proper use of all the moisture that falls on the land. This means not only the prevention of runoff into gullies and lakes but also the uniform distribution of this moisture over the land. In other words, our aim should be to hold every drop of rainwater exactly where it falls in order to utilize it to the fullest extent in maintaining vegetation for the prevention of wind erosion.

Indications to date point to pasture furrowing on the contour as the most feasible plan for accomplishing this purpose. Solid listing has been tried out at the Spur, Texas, Experiment Station with very gratifying results, the amount of forage being much heavier on the furrowed than on the unfurrowed sod. Buffalo grass will creep across the furrow in one year under normal conditions and should cover the ridges in two or three years, depending on rainfall and the condition of the pasture before furrowing.

Badly depleted pastures, if left to recover without treatment save grazing control, may take many years to regain satisfactory cover.

The spacing of these contour furrows should be carefully considered to get the best results. It is quite obvious that solid listing on the contour will give the maximum distribution of rainwater and where the rainfall is sufficient to maintain a solid turf, this treatment should be the ultimate aim. However, the furrows should be spaced far enough apart to prevent overlapping of the dirt thrown up and forming a high ridge between the furrows. A strip of sod of about a furrows width left between the furrows will aid in grassing over the disturbed soil.

Where the rainfall is so low that but a sparse vegetative cover was maintained under virgin conditions, it may be more feasible to space the furrows somewhat farther apart, thus causing greater concentration of the available moisture next to the furrows and increasing vegetative growth above normal on that area. This condition, however, would apply to but a small part of this region. On steeper slopes, it may be necessary to construct terraces to control flood waters due to sudden torrential rains.

A number of different implements have been constructed and others are in the process of development for the purpose of doing this furrowing. work. However, under soil conditions permitting its use, the lister is very effective and has the advantage of being readily available to the farmer. If the lister is too light for the job, it has been suggested that a small grader be used by removing the blade and attaching a lister bottom to each beam, thus giving an individual control to each bottom. A shearpin may be used as a precaution against striking large rocks or stumps. Other types of plows may also be used. The better this work can be planned to fit the equipment and means available to the farmer, the less will be the necessary cost. However, it must be remembered that this operation is for the permanent improvement of the pasture and the cost of this operation cannot be considered in the same light as cost of raising a crop for one year on cultivated land.

Some may object to solid furrowing under the impression that the sod may be destroyed and weeds come in and prevent rapid reestablishment of the grass. The results at Spur, however, would indicate otherwise.

It is quite possible that many weeds may come in the first year. However, this operation is not repeated year after year as is the case with cultivated land, and thus as the listed soil again takes on the characteristics of a sod, the weeds are crowded out. The furrowed, reestablished sod is then in a position to make the maximum use of each rain and thus increase its carrying capacity. If it is not desirable to solid furrow the entire pasture the first year, a two or three year program may be worked out to fit the working plan of the farmer.

The same principle applies to cultivated land that is to be turned back to sod. A good plan is to plant an adapted cover crop, such as sudan, listing it in on the contour and the following spring seed the grass in the residue. Thus the furrows are already established when the sod forms

and no further attention is necessary. No one rigid plan can be applied to every farm without exception. Each operator should consider the individual conditions on his own place and work out his plan of procedure to fit those conditions, staying within the limits of the general plan as outlined by the Soil Conservation Service.

WILDLIFE CONSERVATION IN REGION 6

M.S. McMURTREY
ASSOCIATE BIOLOGIST

The wildlife program in this region presents many problems that do not have to be contended with in other sections of the United States. Plants and shrubs must be selected giving due consideration to their drouth resisting qualities, as well as to their value for food and cover.

Wind erosion must be taken into consideration when selecting planting sites for wildlife. Wind obstruction must not be created which would have a tendancy to hummock, not only making it of little value to wildlife, but a hazard to soil conservation. Fence rows and corners of the fields which are considered ideal in most regions can not be utilized at present due to creating such hazards.

Wildlife does not demand the selection of good agricultural land, as abundance of wildlife can be had by utilizing small areas that are cut up in such way as to make them unprofitable for tillage. Gullies can also be controlled from an erosion standpoint and also accomodate many form of wildlife. The proximity to feed would be a determining facter in gulley control planting. In many cases gullies are found backing up into fields making it necessary to furnish only cover to make ideal habitats for quail. The planting arrangement will determine the kind of wildlife habitat that will be developed. Heavy covering might tend to increase our less desirable species. Upland game birds will not penetrate into heavy growth as they desire more open protective covering enabling them to make a quick get away.

The insectivorous birds demand an important place in the program because of their economic value to agriculture. Not being here in large numbers during the winter months their problems are not so difficult. All trees and shrubs planted by the Forester furnish a desirable habitat. All plantings will be made with the view of furnishing protection and as many of their natural foods as possible. In introducing new plants into the region several seasons may elapse before the new plants are accepted as a source of food. If the plants themselves furnish cover, or if cover is nearby, the new plant may become more readily accepted.

The problem of the relation of livestock to wildlife has become vital in many sections of the region, but it is felt that the program worked out by the agronomist will eliminate much of this evil. Also strip cropping will be beneficial in developing a favorable environment so necessary to upland game life.

Wildlife is going to find all activities of the Soil Conservation Service to its advantage, even though not designated as such.

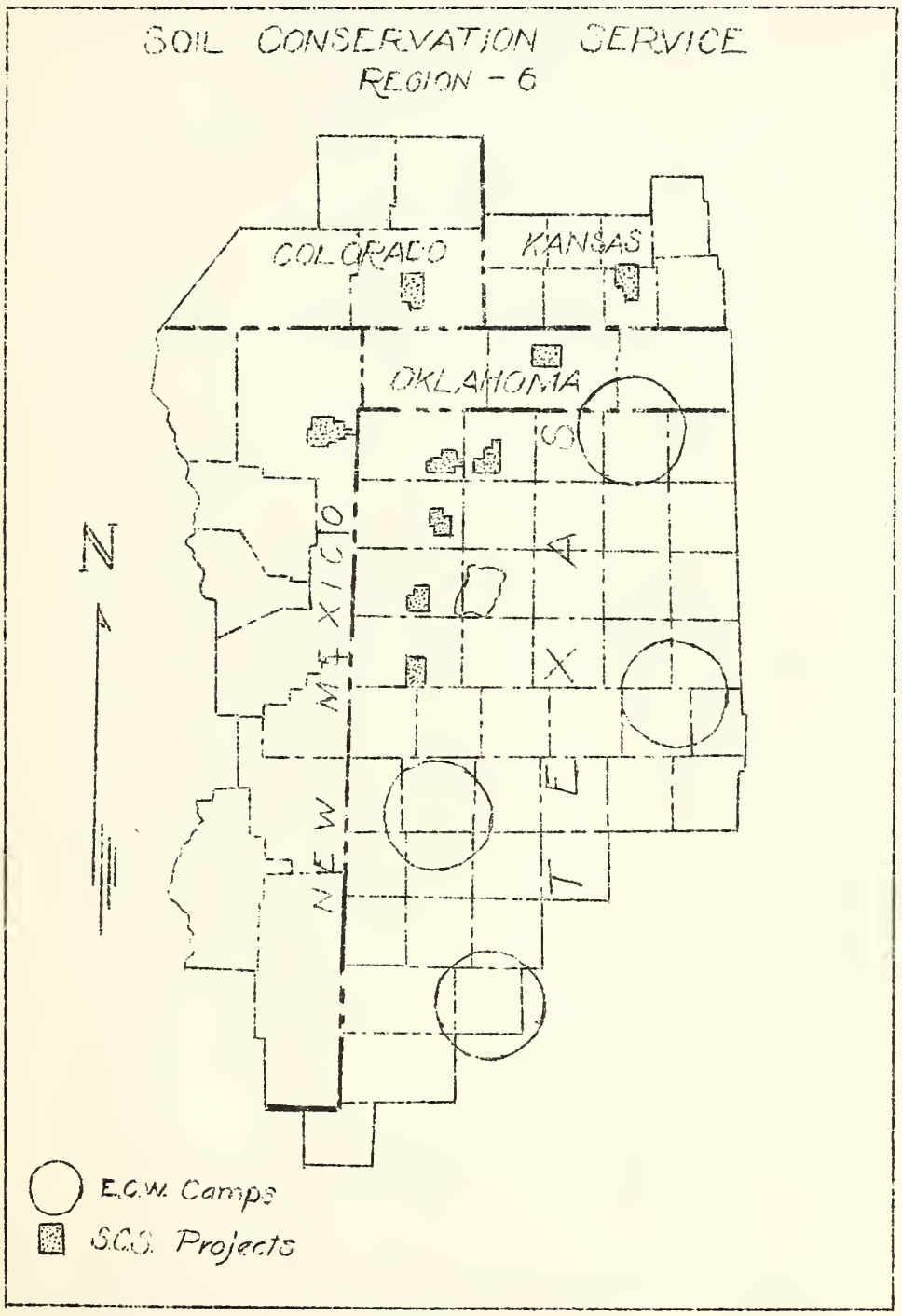
WINDBREAK TREE PLANTING

HUGH G. PORTERFIELD--JUNIOR FORESTER

The question is often asked "Does the Soil Conservation Service plant trees?" The answer is "Yes" but only in sites that offer ideal conditions for their growth. Sites that may be utilized for tree windbreaks are by no means limited. Sites naturally favorable exist along level stretches of roadway where surface waters collect, stand in the ditch and soak into the soil, thus providing an important additional moisture supply. Other naturally favorable locations may be found along drainage ways, creeks, gullies and small lakes in pasture areas adjacent to farm lands. The control of drainage water in roadways by means of loose rock dams and earth baffle dams supported by appropriate vegetation, may also serve to extend natural sites in either direction. Sites are often developed by diverting water from an area and holding it on a site by retention structures. All engineered sites should be developed with strict regard to the area supplying them with drainage water.

While erosion control over the high plains is to a large extent an agronomic problem depending upon seasonal vegetation and its proper usage, no opportunity should be lost to effectively supplement such a program by permanent border vegetation in the form of single tree row windbreak planting and farm group plantings. The permanent value of windbreaks in erosion control is a border protection given fields along bare roadways that are a continuous blowing hazard. Also farmsteads are given protection by group plantings of trees near the improvements when sites can be arranged so that additional water is provided by diversion ditches. Large plantings are often made in the form of snowbreaks and windbreaks for the protection of livestock. These plantings are made near the winter feed lots or wintering grounds. Creek beds and waterways furnish ideal sites for this type of planting. In local areas in Region 6, trees and shrubs are planted in and along gullies to aid as a soil binder against washing. It is obvious from a financial standpoint that well kept roadside tree rows or group plantings around a farmstead makes it more saleable in addition to furnishing windbreaks and shade. Nothing is more pleasing and restful to the eye on these sun scorched plains, than a row of green trees along a roadside, or grouped in a shelterbelt around the farmstead. Trees also provide a refuge and nesting place for bird life that is much needed for destruction of harmful insects.

A cooperator obtains trees by agreeing to protect them from livestock and by building the necessary diversion structures for the collection of additional water. The Service Engineers the site, digs the holes, plants the trees and provides for rodent control. If a farmer in his original agreement fails to contract for tree plantings and decides later that he would like a windbreak or some other type of site his agreement may be amended and if sites are available plantings will be made.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